L4: Entry 10 of 11 File: USPT May 20, 1997

DOCUMENT-IDENTIFIER: US 5631124 A
TITLE: Method of producing a photographic polyester laminate support

Brief Summary Text (6):
On the other hand, a polyester support that is formed from polyethyleneterephthalate (hereinafter abbreviated as PET) excels in mechanical strength and is suitable for making a thin support. But it has the drawback that the core set curl cannot be recovered. With regard to a method of removing this drawback from the polyester support, U.S. Pat. No. 4,141,735 describes a method of preventing the core set curl, which method comprises subjecting a polyester-series polymer to heat processing at its glass transition temperature (hereinafter referred to as Tg) or a temperature lower than the Tg (hereinafter referred to as "below Tg annealing," abbreviated as BTA).

DOCUMENT-IDENTIFIER: US 6797458 B2
TITLE: Photographic multi-layer film base comprising 1,4-cyclohexane dimethanol

Brief Summary Text (6):
Another general problem with PET film is its tendency to take up high levels of curl during storage in cartridges at high temperatures and its inability to sufficiently lower this curl during photoprocessing as commonly exhibited by CTA-based photographic films. A solution to the latter problem was proposed in U.S. Pat. No. 5,556,739 to Nakanishi et al, U.S. Pat. No. 5,387,501 to Yajima et al., and U.S. Pat. No. 5,288,601 to Greener et al. in which multilayered supports comprise polyesters modified by sulfonate and other hydrophilic moieties that facilitate, in wet processing, recovery of curl imposed on the film during storage in a cartridge. Another general approach to lowering the tendency of a polyester film base to take up curl (core-set) during storage is through annealing at elevated temperature and/or by raising the glass transition temperature (Tg) of the polyester.

defects, e.g., core impressions, blocking, etc., which can lower yields and productivity.

US Patent No. 6,558,884 discloses a poly(ethylene terephthalate)-based photographic film base having improved properties with regard to cutting, perforating, and other finishing or photofinishing operations. The film base is made of a poly(ethylene terephthalate)-based material comprising a specified amount of monomeric units derived from 1,4-cyclohexanedimethanol, such that the film base has a specified cutting-related property.

SUMMARY OF THE INVENTION

It has been found that the use of a high-CHDM PET-based support for an imaging element allows the support material to be annealed very rapidly (less than 6 min) to achieve acceptable core-set and post-process curl properties. With this fast annealing process, it is possible to have an effective in-line annealing step to yield a more efficient process with less annealing-induced defects.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a process of annealing a film base or a film support comprising a film base, which film base or support is used in a silver-halide photographic film comprising at least one emulsion layer coated on the support, with the emulsion layer comprising gelatin as a major component. The method of manufacture of such a film is well known in the art.

In accordance with the process of the invention, the film support is annealed at temperatures between 60°C and Tg + 15°C, preferably 60°C and Tg + 10°C for a time preferably less than 6 minutes, wherein Tg is the glass transition temperature of the unprocessed amorphous polyester material used in the film base of the support. In a preferred embodiment, the post-process curl is less than 60 m^{-1} after annealing and wherein the post-process curl is greater than 70 m^{-1} without annealing. In a preferred embodiment, the support is annealed at a temperature between 80 and 105°C, preferably 85 to 100°C, for less than 6 minutes, preferably less than 4 minutes, more preferably about 3 minutes.

WEST Search History

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DATE: Thursday, April 07, 2005

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☐	L2	anneal$4 with pet	214
☐	L3	L2 and (core set or post process curl$4)	5
☐	L4	(pet or polyethylene terephthalate) same anneal$4 same (core set or post process$4curl$4)	11
☐	L5	4141735.pn.	2
☐	L6	5556739.pn.	2
☐	L7	5387501.pn.	2
☐	L8	5288601.pn.	2

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☐	L2	anneal$4 with pet	214
☐	L3	L2 and (core set or post process curl$4)	5
☐	L4	(pet or polyethylene terephthalate) same anneal$4 same (core set or post process$4curl$4)	11
☐	L5	4141735.pn.	2
☐	L6	5556739.pn.	2
☐	L7	5387501.pn.	2
☐	L8	5288601.pn.	2
☐	L9	6165699.pn. and dimethanol	0
☐	L10	4141735.pn. and dimethanol	1
☐	L11	L10 and repeat unit	0
☐	L12	5556739.pn. and dimethanol	1
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☐	L14	5288601.pn. and dimethanol	1
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☐	L16	5387501.pn. and dimethanol	0
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☐	L19	L7 and anneal$4 with tg	0
☐	L20	L8 and anneal$4 with tg	0

END OF SEARCH HISTORY

Day : Thursday

Date: 4/7/2005
Time: 16:43:21

PALM INTRANET

Inventor Name Search Result

Your Search was:

Last Name = GREENER
First Name = JEHUDA

Application#	Patent#	Status	Date Filed	Title	Inventor Name
06554864	4582655	150	11/25/1983	PRODUCTION OF OPTICAL ELEMENT WITH A VARYING REFRACTIVE INDEX	GREENER, JEHUDA
07299209	Not Issued	161	01/23/1989	PROCESS FOR THE PRODUCTION OF LOW BIREFRINGENT POLYMER FILMS	GREENER, JEHUDA
08095137	5288601	150	07/21/1993	LIGHT SENSITIVE SILVER HALIDE ELEMENT HAVING PHOTOGRAPHIC FILM BASE WITH IMPROVED CURL	GREENER, JEHUDA
08098488	5385704	150	07/27/1993	PROCESS OF MAKING POLYETHYLENE TEREPHTHALATE PHOTOGRAPHIC FILM BASE	GREENER, JEHUDA
08305007	5607826	250	09/13/1994	POLYETHYLENE TEREPHTHALATE PHOTOGRAPHIC FILM BASE	GREENER, JEHUDA
08433305	5508135	150	05/03/1995	IMAGING ELEMENT COMPRISING AN ELECTRICALLY-CONDUCTIVE LAYER EXHIBITING IMPROVED ADHESIVE CHARACTERISTICS	GREENER, JEHUDA
08574471	5599658	150	12/19/1995	PHOTOGRAPHIC FILM BASE AND PHOTOGRAPHIC ELEMENTS	GREENER, JEHUDA
08697746	5795512	150	08/29/1996	METHOD AND APPARATUS FOR REDUCING CURL IN WOUND ROLLS OF PHOTOGRAPHIC FILM	GREENER, JEHUDA
08752369	5759756	150	11/19/1996	CO-EXTRUDED FILM WITH NON-CRYSTALLINE CORE	GREENER, JEHUDA

08948219	6071682	150	10/09/1997	CONTROL OF CORE-SET CURL OF PHOTOGRAPHIC FILM SUPPORTS BY COATED LAYERS	GREENER, JEHUDA
09223876	Not Issued	161	12/31/1998	PROCESS OF MAKING POLYETHYLENE TEREPHTHALATE PHOTOGRAPHIC FILM BASE	GREENER, JEHUDA
09472485	6197486	150	12/27/1999	REFLECTIVE PRINT MATERIAL WITH EXTRUDED ANTISTATIC LAYER	GREENER, JEHUDA
09472486	6207361	150	12/27/1999	PHOTOGRAPHIC FILM WITH BASE CONTAINING POLYMERIC ANTISTATIC MATERIAL	GREENER, JEHUDA
09472487	6379780	150	12/27/1999	PERMEABLE SURFACE IMAGINGSUPPORT	GREENER, JEHUDA
09475843	6599991	150	12/30/1999	IN-SITU BLENDING OF POLYESTERS WITH POLY (ETHER IMIDE)	GREENER, JEHUDA
09731271	6485896	150	12/06/2000	EMULSION COMPOSITION TO CONTROL FILM CORE-SET	GREENER, JEHUDA
09731382	Not Issued	161	12/06/2000	SUBLIMATE ELIMINATION IN DYED POLYESTER FILMS BY USE OF BARRIER LAYERS	GREENER, JEHUDA
09853515	6465140	150	05/11/2001	METHOD OF ADJUSTING CONDUCTIVITY AFTER PROCESSING OF PHOTOGRAPHS	GREENER, JEHUDA
09853846	6436619	150	05/11/2001	CONDUCTIVE AND ROUGHENING LAYER	GREENER, JEHUDA
09853905	Not Issued	161	05/11/2001	ANTISTAT OF ONIUM SALT AND POLYETHER POLYMER	GREENER, JEHUDA
10027023	6555303	150	12/21/2001	PHOTOGRAPHIC FILM BASE COMPRISING A POLY (ETHYLENE TEREPHTHALATE)-BASED MATERIAL	GREENER, JEHUDA
10028865	6514646	150	12/21/2001	BALANCED ARCHITECTURE FOR ADHESIVE IMAGE MEDIA	GREENER, JEHUDA
10036668	6558884	150	12/21/2001	PHOTOGRAPHIC FILM BASE COMPRISING A POLY (ETHYLENE TEREPHTHALATE)-BASED MATERIAL	GREENER, JEHUDA

10037050	6645690	150	12/21/2001	PHOTOGRAPHIC MEMBER WITH FLEXIBILIZER MATERIAL	GREENER, JEHUDA
10094289	Not Issued	168	03/08/2002	PHOTOGRAPHIC ELEMENT WITH POLYESTERS BLENDED WITH POLY (ETHER IMIDE)	GREENER, JEHUDA
10094977	6867927	150	03/11/2002	TRANSPARENT SURFACE FORMED COMPLEX POLYMER LENSES	GREENER, JEHUDA
10133836	6872501	150	04/26/2002	ANTISTAT OF ONIUM SALT AND POLYETHER POLYMER	GREENER, JEHUDA
10170117	6838165	150	06/12/2002	CONDUCTIVE AND ROUGHENING LAYER	GREENER, JEHUDA
10279891	6737226	150	10/24/2002	PROCESS FOR MAKING POLYESTER PHOTOGRAPHIC FILM BASE AND PHOTOGRAPHIC ELEMENT COMPRISING SAID BASE	GREENER, JEHUDA
10320330	Not Issued	041	12/16/2002	SUBLIMATE ELIMINATION IN DYED POLYESTER FILMS BY USE OF BARRIER LAYERS	GREENER, JEHUDA
10325386	6797458	150	12/20/2002	A PHOTOGRAPHIC MULTI-LAYER FILM BASE COMPRISING 1,4-CYCLOHEXANE DIMETHANOL	GREENER, JEHUDA
10327365	6727052	150	12/20/2002	MULTILAYER PHOTOGRAPHIC FILM AND AN IMAGING ELEMENT MADE OF SAID BASE	GREENER, JEHUDA
10427399	Not Issued	041	05/01/2003	SUBLIMATE ELIMINATION IN DYED POLYESTER FILMS BY USE OF BARRIER LAYERS	GREENER, JEHUDA
10436654	Not Issued	030	05/13/2003	MANUFACTURING PROCESS AND USE FOR OPEN CELLED MICROCELLULAR FOAM	GREENER, JEHUDA
10436740	Not Issued	094	05/13/2003	MANUFACTURING PROCESS FOR OPEN CELLED MICROCELLULAR FOAM	GREENER, JEHUDA
10443188	6703184	150	05/22/2003	LOW MOISTURE DONOR SUBSTRATE COATABLE WITH ORGANIC LAYERS TRANSFERRABLE IN RESPONSE TO INCIDENT RADIATION	GREENER, JEHUDA
10633183	Not	030	08/01/2003	PROCESS FOR RAPID	GREENER,

	Issued			ANNEALING OF A POLYESTER FILM BASE TO CONTROL FILM CURL	JEHUDA
10667982	Not Issued	071	09/22/2003	ONE-TIME-USE CAMERA CONTAINING IMPROVED FILM ELEMENT	GREENER, JEHUDA
10797982	Not Issued	071	03/11/2004	CONDUCTIVE AND ROUGHENING LAYER	GREENER, JEHUDA
10954330	Not Issued	020	09/30/2004	OPTICAL FILMS AND PROCESS FOR MAKING THEM	GREENER, JEHUDA

Inventor Search Completed: No Records to Display.

Search Another: Inventor **Last Name** greener **First Name** jehuda Search

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PALM INTRANET

Inventor Name Search Result

Your Search was:

Last Name = CONTESTABLE
First Name = BEVERLY

Application#	Patent#	Status	Date Filed	Title	Inventor Name
10633183	Not Issued	030	08/01/2003	PROCESS FOR RAPID ANNEALING OF A POLYESTER FILM BASE TO CONTROL FILM CURL	CONTESTABLE, BEVERLY A.
08948219	6071682	150	10/09/1997	CONTROL OF CORE-SET CURL OF PHOTOGRAPHIC FILM SUPPORTS BY COATED LAYERS	CONTESTABLE, BEVERLY A.

Inventor Search Completed: No Records to Display.

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PALM INTRANET

Inventor Name Search Result

Your Search was:

Last Name = GILLMOR
First Name = JEFFREY

Application#	Patent#	Status	Date Filed	Title	Inventor Name
10006545	6767951	150	11/13/2001	POLYESTER NANOCOMPOSITES	GILLMOR, JEFFREY R.
10633183	Not Issued	030	08/01/2003	PROCESS FOR RAPID ANNEALING OF A POLYESTER FILM BASE TO CONTROL FILM CURL	GILLMOR, JEFFREY R.
11000124	Not Issued	020	11/30/2004	COEXTRUDED TONER RECEIVER LAYER FOR ELECTROPHOTOGRAPHY	GILLMOR, JEFFREY R.

Inventor Search Completed: No Records to Display.

Search Another: Inventor

Last Name	First Name	
gillmor	jeffrey	Search

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Search Results - Record(s) 1 through 2 of 2 returned.

☐ 1. Document ID: US 20050026088 A1

Using default format because multiple data bases are involved.

L23: Entry 1 of 2 File: PGPB Feb 3, 2005

PGPUB-DOCUMENT-NUMBER: 20050026088
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050026088 A1

TITLE: Process for rapid annealing of a polyester film base to control film curl

PUBLICATION-DATE: February 3, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Greener, Jehuda	Rochester	NY	US	
Contestable, Beverly A.	Hilton	NY	US	
Gillmor, Jeffrey R.	Brockport	NY	US	
Rao, YuanQiao	Pittsford	NY	US	

US-CL-CURRENT: 430/401

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw D

☐ 2. Document ID: US 6727052 B1

L23: Entry 2 of 2 File: USPT Apr 27, 2004

US-PAT-NO: 6727052
DOCUMENT-IDENTIFIER: US 6727052 B1

TITLE: Multilayer photographic film and an imaging element made of said base

DATE-ISSUED: April 27, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Rao; YuanQiao	Rochester	NY		
Greener; Jehuda	Rochester	NY		
Fehnel; Robert H.	Rochester	NY		
Brickey; Michael R.	Webster	NY		

Record List Display

US-CL-CURRENT: 430/496; 264/173.15, 264/173.16, 264/210.7, 428/480, 430/494, 430/533

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw. D

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Term	Documents
GREENER	1909
GREENERS	0
CORE	407021
CORES	79850
SET	2402524
SETS	627165
CURL	22747
CURLS	5529
BIAXIALLY	33842
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☐	L27	L26 and mol	9
☐	L28	L27 and anneal$4	7
☐	L29	L28 and Tg	7

☐	L30	L28 and Tg	7
☐	L31	L30 and total glycol	7
☐	L32	L31 and 60	7
☐	L33	L32 and 15	7
☐	L34	L33 and 6	7
☐	L35	L34 and min	7
☐	L36	L35 and annealing with 60 with Tg	0
☐	L37	L35 and annealing with Tg	6
☐	L38	L37 and 6 min	1
☐	L39	L38 and Tg+15	0
☐	L40	L37 and time with less	6

END OF SEARCH HISTORY